

Current Projects - Fish Culture

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Managing Ponds for Improved Hybrid Striped Bass Production

In response to angler demand for hybrid striped bass (HSB) fisheries, Iowa Department of Natural Resources staff have obtained HSB fry from cooperating states for fisheries enhancement and fish culture purposes. However, the supply of fry is limited and pond fingerling production has been inconsistent and below expectations. The purpose of this study is to examine concerns related to fry transportation and fish production techniques and to develop a management plan for production of HSB in both plastic-lined (Rathbun) and earthen (Mt. Ayr) ponds. This plan will include best management practices for: 1) transporting fry, 2) timing of initial stocking, 3) recommended stocking densities, 4) pond fertilization regimes, and 5) water quality management. In the 2012 culture season four trials were conducted, two evaluating fry transport methods, one evaluating the necessity of pond fertilization, and the fourth comparing the hybrid crosses.

Mt. Ayr Hatchery typically obtains fry from a hatchery in Oklahoma which has low alkalinity waters and thus a pH drop was observed during fry transportation in 2010, which may be linked to poor survival in culture ponds. A Kansas hatchery also regularly provide fry to Iowa and water from this hatchery was about 200 alkalinity units higher than the historical alkalinity of Oklahoma water. Alkalinity is a measure of the buffer capacity of water, or its ability to stay at a pH level despite fry respiration which drives down pH. Fry from Kansas were stocked in 2011 and resulted in high survival rates (54%). In the first transportation trial, the pH decline was not as dramatic as previously observed. A second experiment was conducted during van and plane transport from Oklahoma to Iowa because we suspected different results may be obtained in moving boxes where fry may respire more. In the second trial, lower fry density and use of the pH buffer resulted in higher pH values during van transport, but in air transport pH was affected only with use of buffer but not with lower fry density. Elapsed air travel time was about half that of van transportation, which may indicate that during a short air transport, the higher bag density could be used.

The third trial focused on the need of organic fertilizers in earthen ponds at Mt. Ayr Fish Hatchery. On May 17, 2012, sunshine bass fry from Keo Fish Farm, Inc (Keo, AR) were stocked at a rate of 80,000 fry/acre, 4-6 days after pond flooding. Survival rate was variable (14% survival in unfertilized vs. 22% in fertilized ponds) at Mt. Ayr with fertilized ponds having higher survival than ponds not fertilized; growth rates were similar between the two treatments.

The fourth trial compared aquaculture production performance of two hybrid crosses of white and striped bass, palmetto and sunshine bass, at Rathbun Fish Culture Research Facility. Production performance was statistically similar between hybrid crosses despite sunshine bass weighing 0.8 g more than the palmetto bass. Survival at harvest was 45.2% for palmetto bass and 28.7% for sunshine bass, but the difference was not a significant difference, mainly due to the fact that survival in sunshine bass ponds was highly variable.

After two years of research we have concluded that fertilization is needed in the production ponds at Mount Ayr. Fry density and pH buffer use in transportation of fry are important factors that need further evaluation. Further research is needed to compare aquaculture performance of the hybrid crosses as well as the post-stocking performance of the crosses in the fishery.